

## Google StockPrice

### Abstract

This project aims to analyze and visually represent Google's 10-year stock price data using Tableau to create an interactive and insightful dashboard. The primary objective is to enable users to explore key trends, patterns, and fluctuations in Google's stock price over time. The dashboard will include various visualizations, with a focus on a candlestick chart to depict price movements, such as opening, closing, high, and low values. Additional features, such as moving averages, volume, and percentage change, will provide deeper insights into the stock's performance. Through these visualizations, stakeholders can better understand long-term trends and make informed decisions based on historical data.

### Datatype and Dataset Type:

Column	Data Type	Justification
Date	Ordinal	Represents a sequence of time points. The dates follow a specific order, making them inherently ordered.
Open	Quantitative	Numerical values indicating the stock's opening price, allowing for mathematical operations.
High	Quantitative	Numerical values representing the highest price of the stock for the day.
Low	Quantitative	Numerical values representing the lowest price of the stock for the day.
Close	Quantitative	Numerical values indicating the stock's closing price, essential for financial analysis.
Adj Close	Quantitative	Numerical values representing the adjusted closing price, accounting for events like dividends.
Volume	Quantitative	Numerical values indicating the number of shares traded, useful for analyzing trading activity.

### Dataset Type (Tabular Dataset):

#### • Type: Time Series Dataset Justification:

- The dataset records stock prices and trading volumes over a continuous time interval (daily in this case).
- Each entry is dependent on the previous one in terms of time, allowing for trend analysis, forecasting, and temporal pattern recognition.

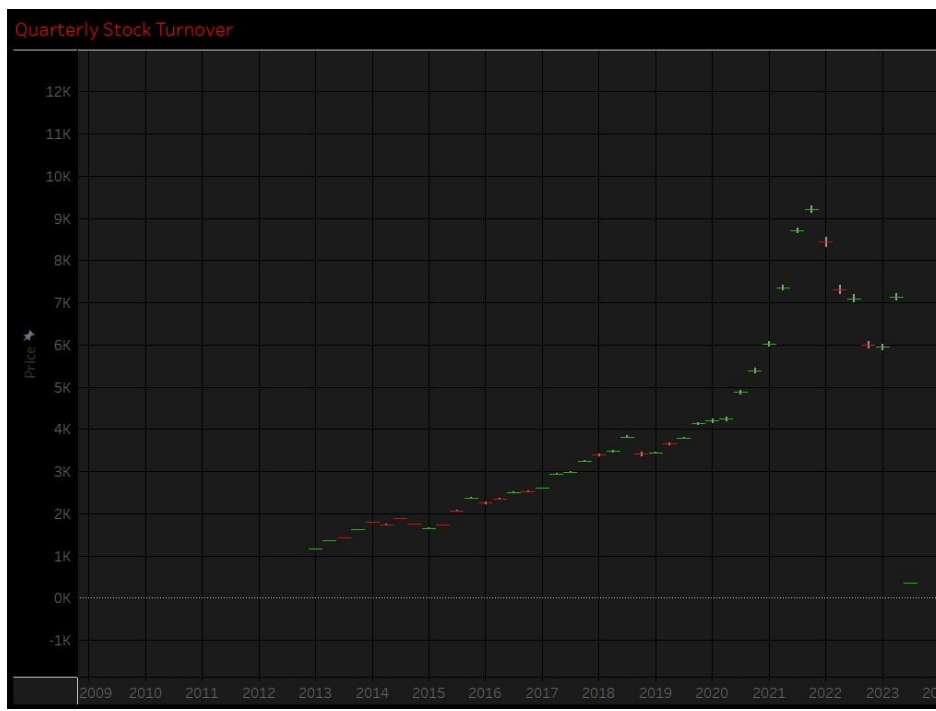
# INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

## Sample Dataset:

Date	Open	High	Low	Close	Adj Close	Volume
02-01-2013	18.0035	18.19319	17.93168	18.09935	18.09935	1.02E+08
03-01-2013	18.14139	18.31657	18.03604	18.10986	18.10986	92635272
04-01-2013	18.25175	18.55531	18.21021	18.46772	18.46772	1.1E+08
07-01-2013	18.40466	18.503	18.28278	18.38714	18.38714	66161772
08-01-2013	18.40691	18.42593	18.12888	18.35085	18.35085	66976956

## Chart Descriptions:

### CANDLESTICK CHART:

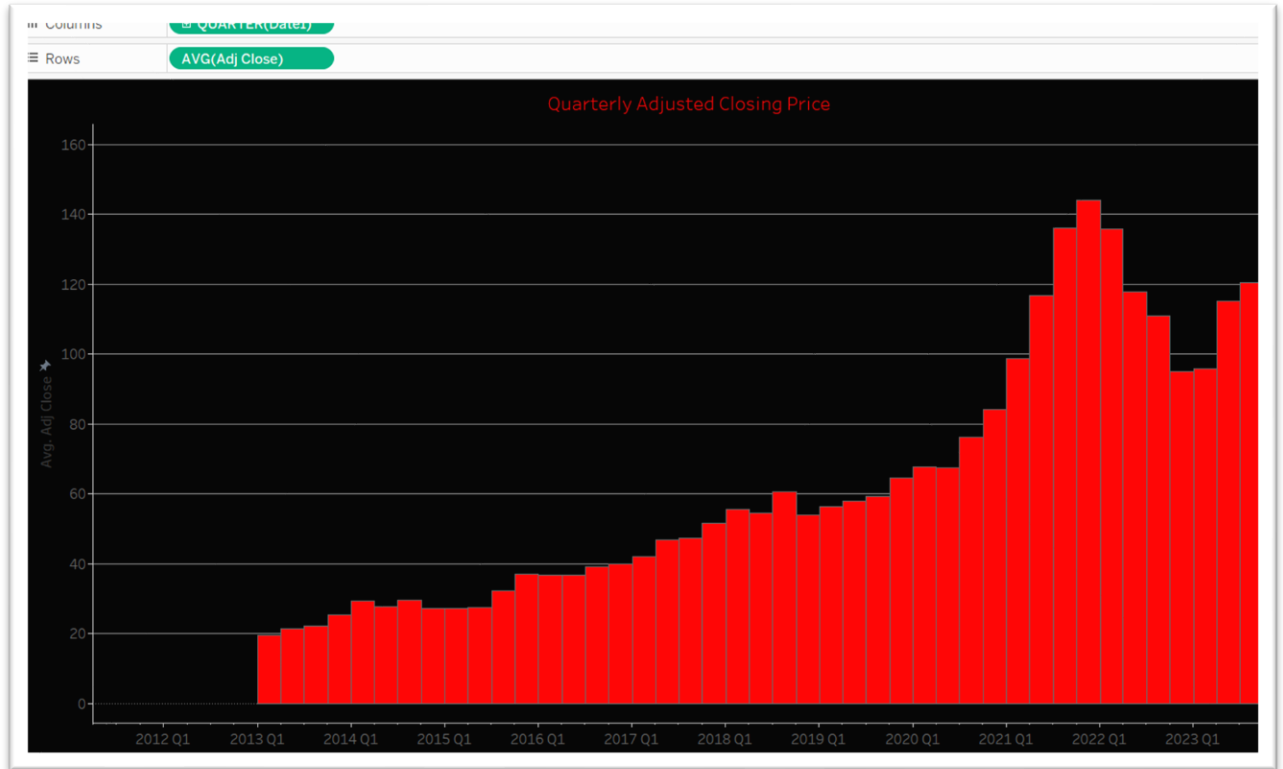


- **Uptrend:** Stock prices show consistent growth from 2015 to 2023.
- **Candlestick Colors:**
  - Green: Price closed higher than opened (bullish quarters).
  - Red: Price closed lower than opened (bearish quarters).
- **Volatility:**
  - Low before 2015 (smaller price movements).
  - High post-2015 (larger fluctuations).
- **Recent Stability:** Growth stabilizes around 2021–2023.

## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

- **Overall:** The stock demonstrates significant long-term growth with occasional corrections.

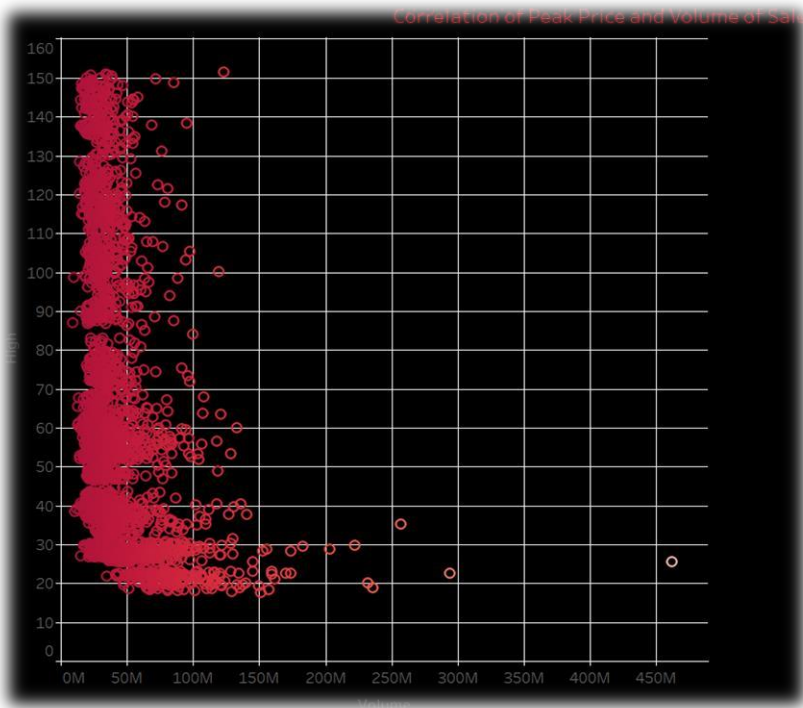
### HISTOGRAM:



- **Title:** The chart shows the **Quarterly Adjusted Closing Price** trend over time (2012 Q1 to 2023 Q1).
- **Uptrend:** A steady increase in the average adjusted closing price from 2012 to 2021.
- **Peak:** Prices peaked in **2022 Q1**, indicating a high market valuation during this period.
- **Decline:** A slight decline is observed after 2022 Q1, followed by partial recovery.
- **Overall:** The stock exhibits long-term growth with recent fluctuations post-peak.

### SCATTER PLOT:

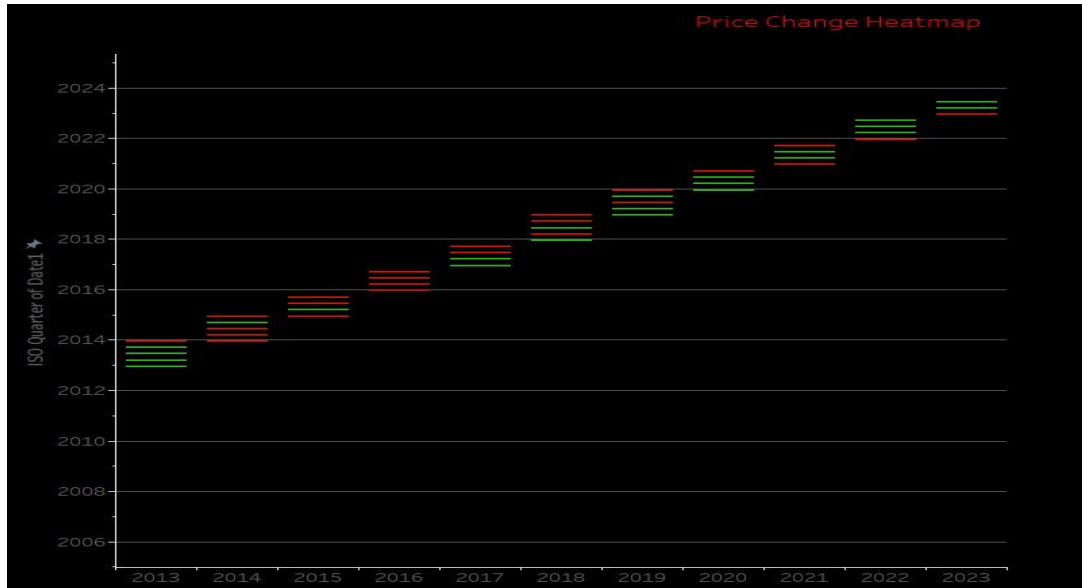
## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT



- **Title:** Correlation of Peak Price (High) and Volume of Sales.
- **Observation:** Most data points cluster at low volumes (0M-100M) and a wide range of peak prices (up to 160).
- **Volume and Price:** Higher prices do not strongly correlate with higher sales volume, as large volumes (>200M) are rare and not consistently associated with peak prices.
- **Conclusion:** The relationship between peak price and sales volume appears weak or nonlinear.

### HEATMAP:

## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT



**Title:** Visualizing ISO Quarter Price Fluctuations **Observations:**

- Displays price changes from 2013 to 2024 by year (rows) and ISO quarter (columns).
- Dark red: Significant price increases; Dark green: Significant price decreases.

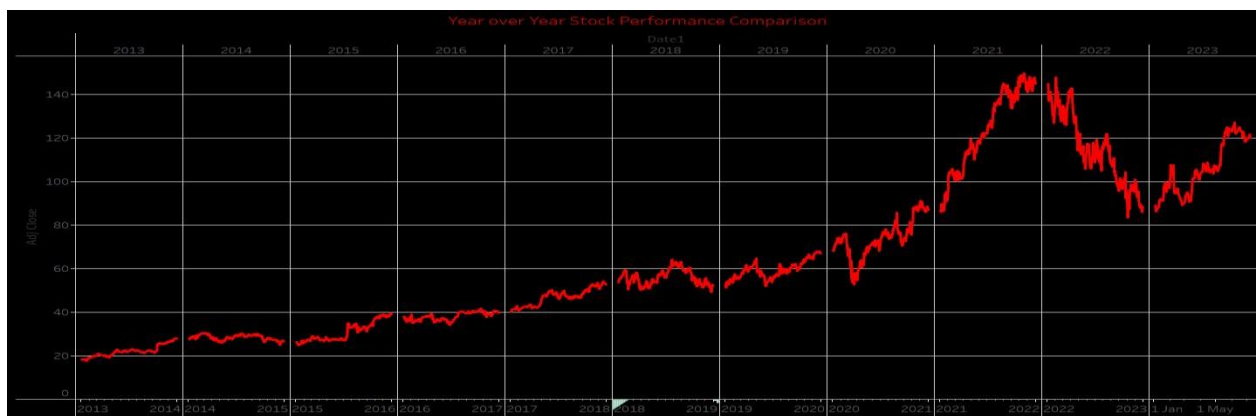
**Interpretation:**

- Highlights periods of significant positive or negative price changes over 12 years.
- Useful for identifying historical trends, patterns, and anomalies in price fluctuations.

**Conclusion:**

- A valuable visualization tool for quickly understanding historical price dynamics and pinpointing periods of interest for analysts and investors.

### LINE CHART:



**Title:** Year-over-Year Stock Performance Comparison **Observations:**

## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

- Stock performance from 2013 to 2023 shows significant **volatility** with sharp increases and decreases.
- **Cyclical patterns** are evident, with highs and lows at different times.

### Interpretation:

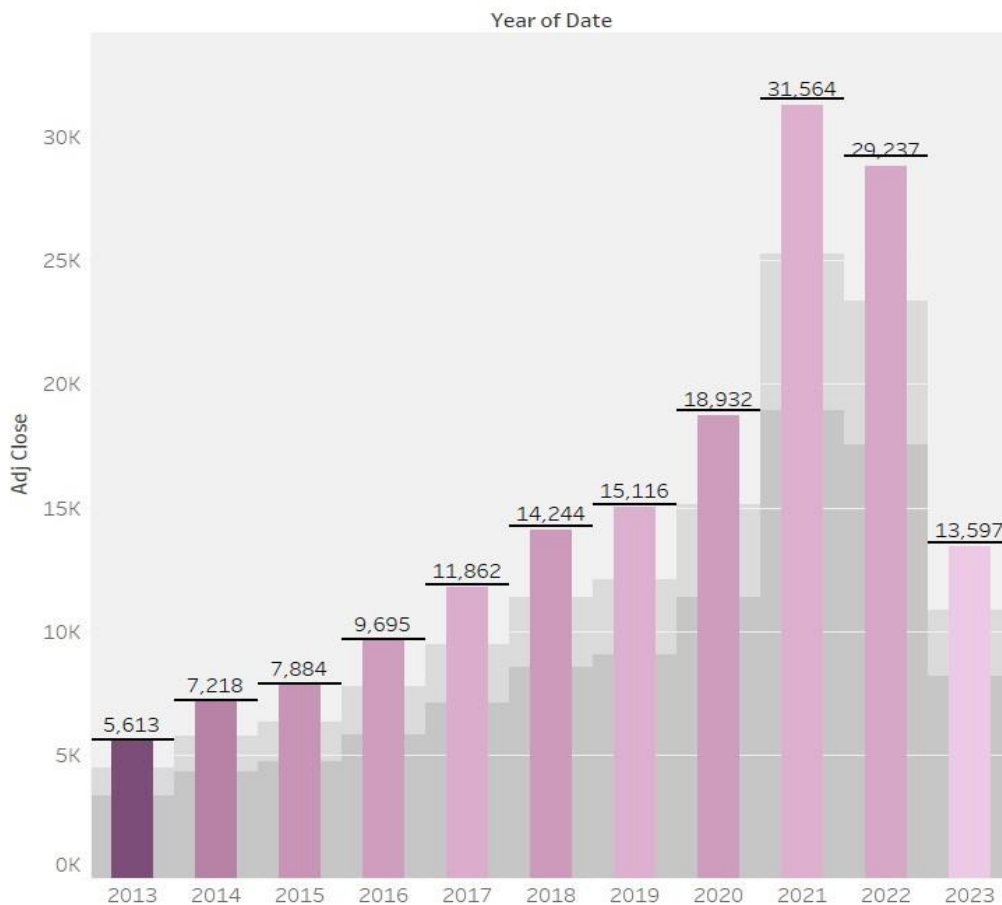
- Volatility indicates high market sensitivity and risk.
- Cyclical movements suggest potential **seasonal or external factors** influencing prices.
- Long-term investors should evaluate the stock's **risk profile** and growth potential.

### Conclusion:

- The comparison highlights the stock's volatile nature. Investors must analyze the factors driving fluctuations to align with their investment strategy.

### BULLET GRAPH:

Bullet Graph



**Title:** Trend Analysis of Annual Stock Prices **Observations:**

## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

- Year-over-year stock prices (2013–2023) show a **steady upward trajectory**.
- **Highest price:** \$31,564 in 2021; **Lowest price:** \$5,613 in 2013.
- Significant price jump observed from 2020 to 2021.

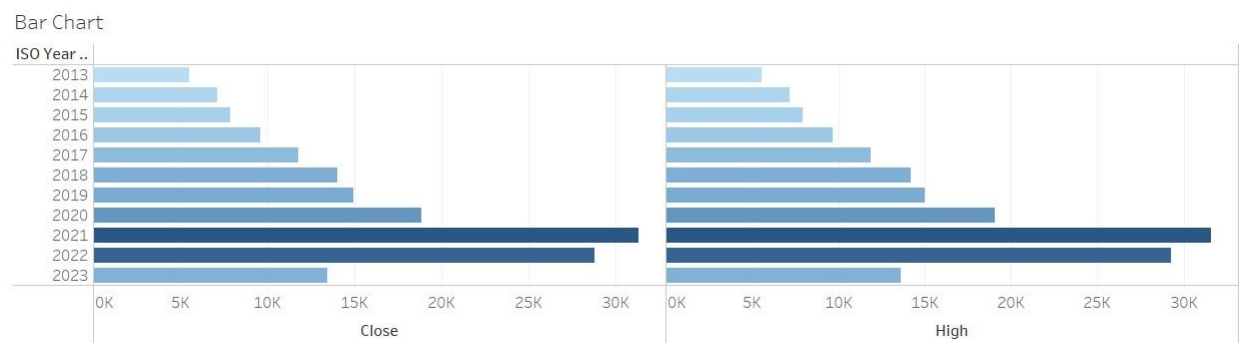
### Interpretation:

- Indicates **strong, sustained growth** in the investment or company.
- Fluctuations suggest sensitivity to **market influences and economic conditions**.
- The 2020–2021 surge likely driven by a major **event or catalyst**.

### Conclusion:

- The stock's long-term performance is positive, with prices **quadrupling** over 11 years.
- Despite overall growth, investors should account for **risks and volatility** in decisionmaking.

### BAR CHART:



### Title: Analyzing ISO Year-over-Year Stock Price Trends Observations:

- Chart displays **closing** and **high prices** from 2013 to 2023.
- Closing prices show a **general upward trend** with fluctuations.
- High prices follow a similar pattern but exceed closing prices in most years.

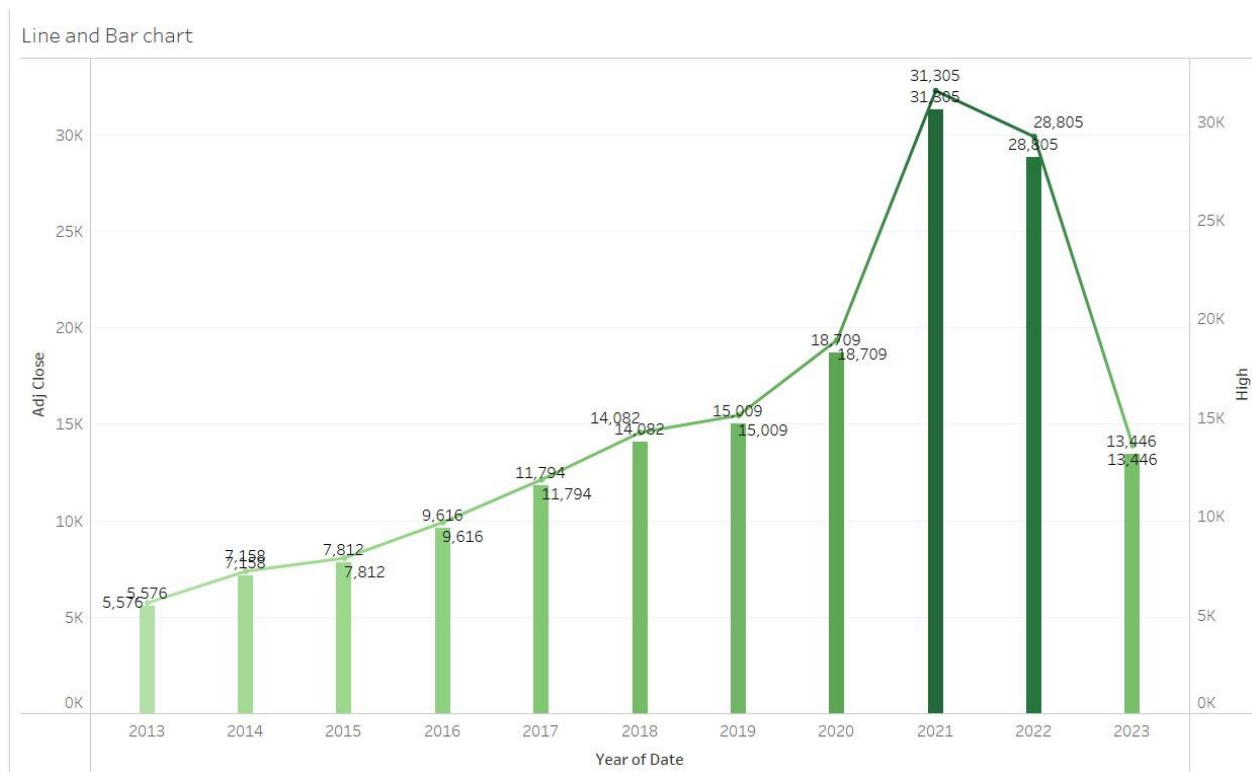
### Interpretation:

- Increasing closing prices indicate **steady long-term growth**.
- Gaps between high and closing prices reflect **volatility** and temporary price spikes. •  
Wider gaps in recent years suggest **increased market activity** and trading volume.

### Conclusion:

- The stock shows strong **growth potential**, but periods of **volatility** warrant cautious evaluation by investors.

### DUAL COMBINATION OF LINE & BAR CHART:



**Title:** Visualizing the Stock Price Trajectory Over Time **Observations:**

- **Line chart:** Adjusted closing prices steadily increased from 2013 to 2023.
- **Bar chart:** High prices reveal significant volatility, peaking in 2021 at \$31,564.
- Highest adjusted closing price (\$31,305) also occurred in 2021.
- Notable **price fluctuations** with sharp increases and declines observed over the years.

**Interpretation:**

- Long-term **growth trend** in adjusted closing prices suggests consistent stock appreciation.



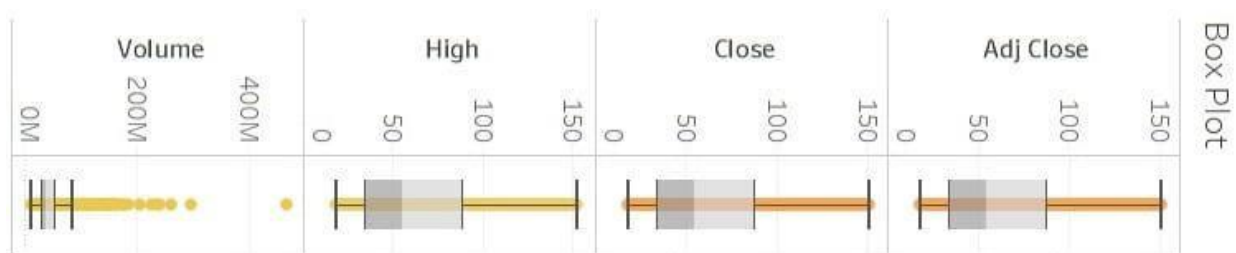
## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

- Divergence between high and closing prices reflects **volatility** and heightened trading activity, especially in recent years.
- Sharp price spikes indicate potential for **both gains and risks** for investors.

### Conclusion:

The chart highlights the stock's strong **growth trajectory** but also underscores its **volatile nature**. Investors should weigh the stock's long-term potential against its high-risk profile when making investment decisions.

### BOX PLOT:



### Title: Relationship Between Stock Volume, Price, and Adjusted Closing **Observation:**

- Horizontal bar charts represent key metrics: **Volume**, **High**, **Close**, **Adj Close**, and **Box Plot**.
- **Volume** chart indicates mostly low-to-moderate trading activity with occasional spikes.
- **High** and **Close** prices show a broad range of fluctuations.
- **Adj Close** depicts a more stable price trend compared to raw closing prices.
- **Box Plot** visualizes the distribution of prices with quartiles and median highlighted.

### Interpretation:

- **Volume** spikes may align with significant market events or trading activity.
- Fluctuating **High** and **Close** prices suggest moderate to high volatility in stock performance.
- **Adj Close** smoothens out irregularities, offering a normalized price view.
- **Box Plot** identifies the spread and typical pricing, aiding in understanding price behavior.

### Conclusion:

The charts provide a detailed overview of stock performance, highlighting **volatility**, **low-to-moderate trading activity**, and the usefulness of **adjusted closing prices** for long-term trend analysis.

PIE CHART:



**Title:** Weekly Sales Analysis Using a Pie Chart **Observation:**

- The pie chart shows sales distribution across weekdays:
  - **Friday** (green) has the highest sales.
  - Followed by **Monday** (blue), **Tuesday** (orange), **Wednesday** (red), and **Thursday** (yellow).

**Interpretation:**

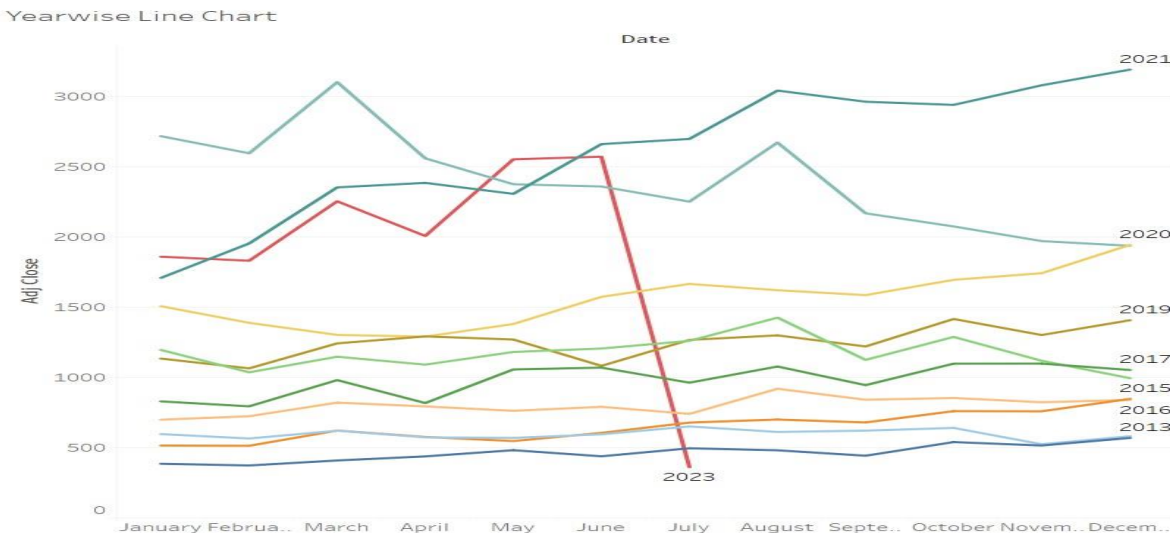
- **Friday's dominance** suggests it as the peak sales day, likely due to end-of-week shopping.
- Uneven slice sizes indicate noticeable differences in sales volume between weekdays.
- Insights can guide strategies for optimizing staffing, inventory, and marketing focus on high-performing days.

**Conclusion:**

The pie chart highlights sales trends by weekday, helping businesses better align resources with customer behavior. Friday's prominence emphasizes its importance in driving revenue, while lower-performing days may benefit from targeted initiatives to boost sales.

# INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

## MULTIPLE LINE-GRAPHS:



### **Title:** Yearwise Stock Price Trends Analysis **Observation:**

- The chart illustrates adjusted closing prices of the stock from 2013 to 2023, with distinct lines for each year.
- Recent years (2020–2023) show the highest prices, with 2021 having the peak.
- Significant volatility is evident, with sharp peaks and valleys in multiple years.
- The overall trend indicates long-term price growth despite yearly fluctuations.

### **Interpretation:**

- The rising prices highlight the stock's long-term growth and appreciation.
- Volatility suggests the stock is influenced by market and economic factors, presenting risks alongside potential rewards.
- The sharp rise in 2021 reflects substantial growth, possibly driven by market-specific events.
- Short-term fluctuations demonstrate the importance of timing for maximizing returns.

### **Conclusion:**

The yearwise chart provides insight into the stock's upward trajectory and inherent volatility. While the long-term growth potential is strong, the risks from annual price swings emphasize the need for strategic investment and risk management.

## HEATMAP:

Heatmap

	Date									
Weekday..	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Monday	3,68,15,18,796	2,53,81,46,348	1,92,58,46,000	1,76,86,74,000	1,51,40,14,000	1,90,95,94,000	1,49,81,76,000	1,94,18,18,000	1,38,38,44,000	1,46,84,000
Tuesday	3,98,21,53,860	2,64,12,93,100	2,24,76,34,000	1,97,17,06,000	1,58,27,36,000	2,06,23,92,000	1,65,13,22,000	2,05,16,40,000	1,52,81,56,000	1,78,53,000
Wednesday	4,06,38,16,116	2,47,29,42,904	2,04,80,94,000	1,89,15,62,000	1,58,34,60,000	1,99,40,60,000	1,45,07,72,000	2,00,89,36,000	1,65,90,00,000	1,88,46,000
Thursday	4,19,99,27,868	2,67,94,10,212	2,19,72,84,000	2,03,40,18,000	1,69,62,16,000	2,09,91,40,000	1,39,11,92,000	1,97,46,68,000	1,50,32,60,000	1,79,10,000
Friday	5,09,25,42,360	3,10,69,06,180	2,51,70,26,000	2,25,81,22,000	1,74,15,96,000	2,20,55,62,000	1,63,42,48,000	2,13,10,76,000	1,61,52,52,000	1,79,71,000

## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

### Title: Weekday Sales Volume Heatmap Analysis **Observation:**

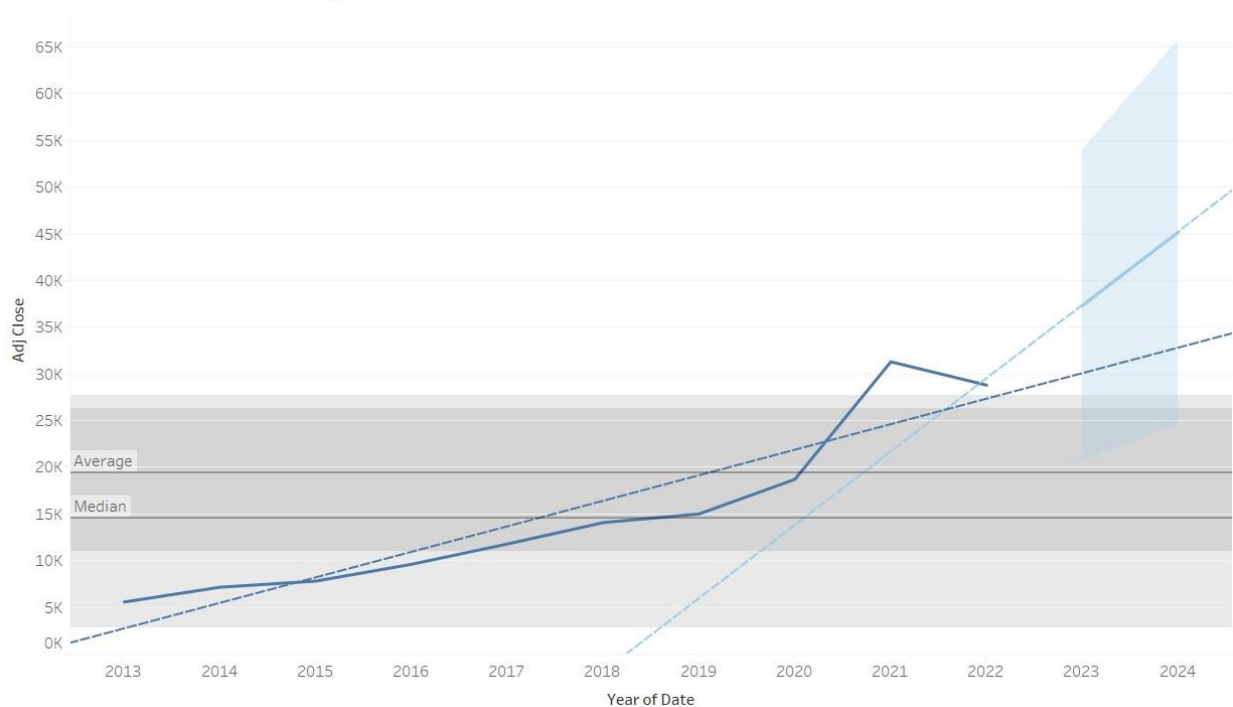
- The heatmap visualizes weekday sales volume from 2013 to 2022, with darker shades representing higher sales.
- Friday consistently records the highest sales volumes, while Monday through Thursday have lower levels.
- Variations in sales volume appear across specific years and weekdays. **Interpretation:**
- Friday's dominance suggests a peak shopping day, potentially driven by end-of-week consumer behavior.
- Lower sales on other weekdays indicate opportunities for targeted strategies, like promotions or campaigns, to boost activity.
- Yearly and daily variations highlight the need to adapt to changing customer preferences and market dynamics.

### Conclusion:

The heatmap reveals clear sales trends, with Friday as the strongest performer. Optimizing sales strategies for other weekdays and adapting to annual shifts in customer behavior can enhance profitability and operational efficiency.

### FORECAST AND TRENDLINE ANALYSIS:

Forecast and Trendline Analysis



### Title: Forecast and Trendline Analysis of Adjusted Close Values Over Time

#### Observations

1. The chart represents the sum of adjusted close values over the years from 2013 to 2024.

## INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

2. The blue solid line indicates **actual data** trends, while the dashed light blue line shows the **forecasted estimates**.
3. Shaded regions highlight **confidence intervals** for the forecasts, indicating uncertainty in predictions.
4. Average and median reference lines are displayed across the graph.

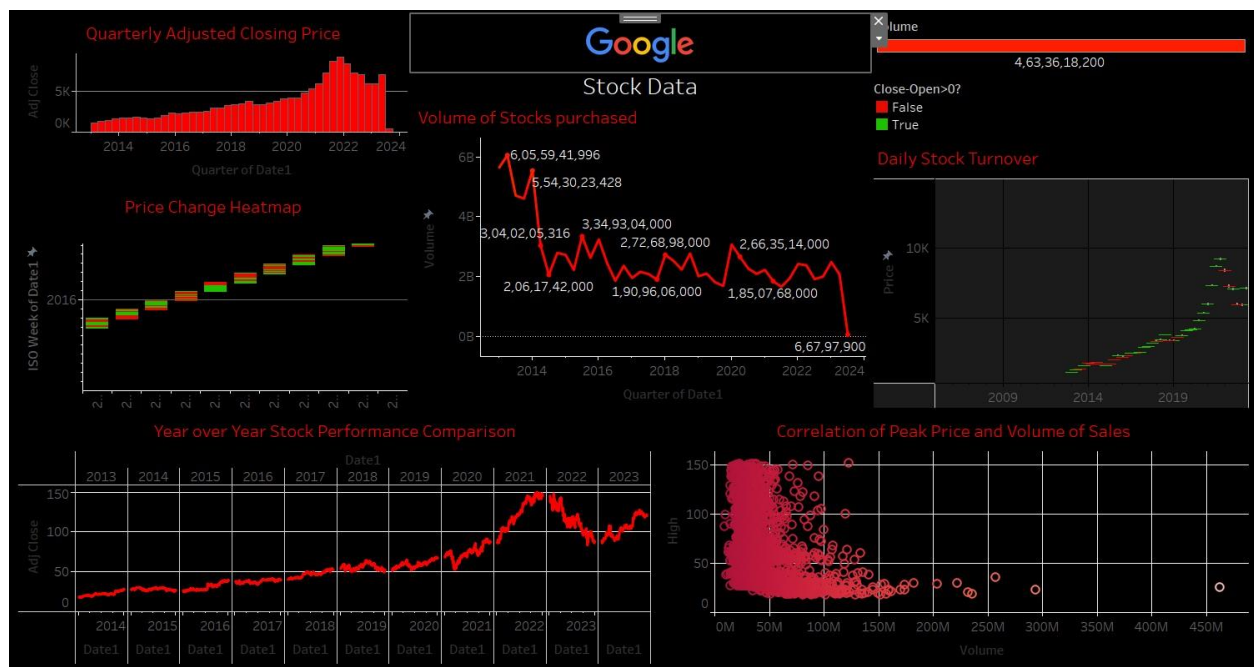
### Interpretation

- **Historical Trend:** A steady increase is observed in the adjusted close values until around 2019. This is followed by a more fluctuating trend from 2020 onwards.
- **Forecast:** The forecasted trend indicates continued growth in the adjusted close values beyond the actual data, with an upward trajectory into 2024.
- **Confidence Interval:** The widening shaded region post-2022 signifies increasing uncertainty in the forecasted values.

### Conclusion

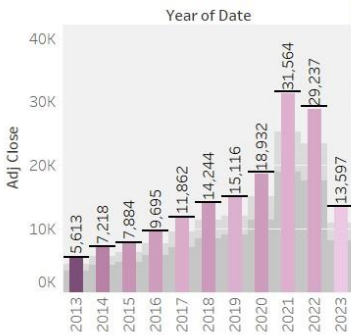
- **Growth Insight:** The adjusted close values show a consistent upward trend, with significant growth expected in the coming years.
- **Forecast Reliability:** While forecasts indicate growth, decision-making should account for increasing uncertainty reflected in the confidence intervals.
- **Actionable Steps:** Further analysis may focus on factors influencing fluctuations in recent years to refine forecasting accuracy and strategic planning.

## OVERALL DASHBOARD

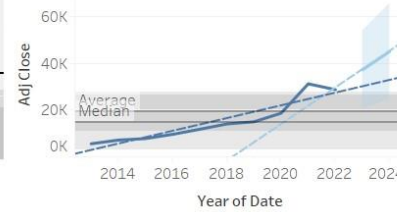


# INFORMATION VISUALIZATION J-COMPONENT FINAL REPORT

Bullet Graph



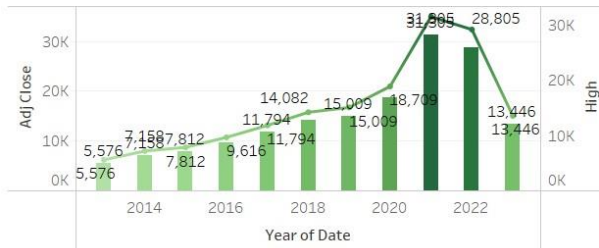
Forecast and Trendline Analysis



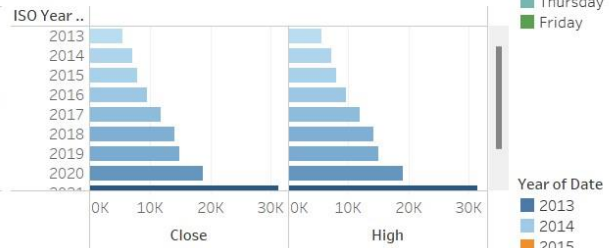
Box Plot



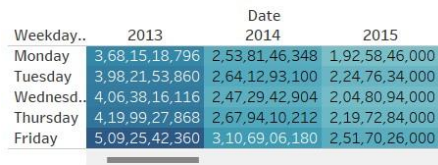
Line and Bar chart



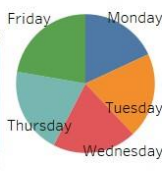
Bar Chart



Heatmap



Pie Chart



Yearwise Line Chart

